



Agency for Healthcare Research and Quality
Advancing Excellence in Health Care



NATIONAL
GUIDELINE
CLEARINGHOUSE

General

Guideline Title

Screening for osteoporosis: U.S. Preventive Services Task Force recommendation statement.

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for osteoporosis: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2011 Mar 1;154(5):356-64. [PubMed](#)

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Berg AO. Screening for osteoporosis in postmenopausal women: recommendations and rationale. *Am J Nurs* 2003 Jan;103(1):73-80; discussion 81. [33 references]

Screening for osteoporosis in postmenopausal women: recommendations and rationale. *Am Fam Physician* 2002 Oct 15;66(8):1430-2.

Recommendations

Major Recommendations

The U.S. Preventive Services Task Force (USPSTF) grades its recommendations (A, B, C, D, or I) and identifies the levels of certainty regarding net benefit (High, Moderate, and Low). The definitions of these grades can be found at the end of the "Major Recommendations" field.

Summary of Recommendations and Evidence

The USPSTF recommends screening for osteoporosis in women aged 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors. This is a B recommendation.

The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of screening for osteoporosis in men. This is an I statement.

Clinical Considerations

Patient Population Under Consideration

This recommendation applies to older adults in the general U.S. population who do not have a history of an osteoporotic fracture, osteoporosis secondary to another condition, or other specific clinical indications for bone measurement testing. The USPSTF did not define a specific upper age limit for screening in women because the risk for fractures continues to increase with age and treatment harms remain no greater than small.

Clinicians should take into account the patient's remaining lifespan when deciding whether to screen patients with significant illness. In the Fracture Intervention Trial, the benefit of treatment emerged 18 to 24 months after initiation of treatment.

The quantity and quality of data on osteoporotic fracture risk other than hip fracture are much less for Asian, American Indian or Alaska Native, Hispanic, and black women than for white women. The USPSTF's recommendation to screen women aged 65 years or older for osteoporosis applies to all racial and ethnic groups because the harms of the screening tests are no greater than small, the consequences of failing to identify and treat women who have low bone mineral density (BMD) are considerable, and the optimal alternative age at which to screen nonwhite women is uncertain.

Assessment of Risk

Multiple instruments to predict risk for low BMD and fractures have been developed and validated for use in postmenopausal women, but few have been validated for use in men. To predict fracture risk, the area under the receiver-operating characteristic curve ranges from 0.48 to 0.89. Less complex instruments (that is, those with fewer variables) seem to perform as well as more complex ones. The USPSTF found no studies that assessed the effect on patient outcomes of using risk prediction instruments alone or in combination with bone measurement tests.

The USPSTF used the FRAX (Fracture Risk Assessment) tool (World Health Organization Collaborating Centre for Metabolic Bone Diseases, Sheffield, United Kingdom), available at www.shef.ac.uk/FRAX/ , to estimate 10-year risks for fractures because this tool relies on easily obtainable clinical information, such as age, body mass index (BMI), parental fracture history, and tobacco and alcohol use; its development was supported by a broad international collaboration and extensively validated in two large U.S. cohorts; and it is freely accessible to clinicians and the public. The FRAX tool includes questions about previous dual-energy x-ray absorptiometry (DXA) results but does not require this information to estimate fracture risk.

Based on the U.S. FRAX tool, a 65-year-old white woman with no other risk factors has a 9.3% 10-year risk for any osteoporotic fracture. White women between the ages of 50 and 64 years with equivalent or greater 10-year fracture risks based on specific risk factors include but are not limited to the following persons: 1) a 50-year-old current smoker with a BMI less than 21 kg/m², daily alcohol use, and parental fracture history; 2) a 55-year-old woman with a parental fracture history; 3) a 60-year-old woman with a BMI less than 21 kg/m² and daily alcohol use; and 4) a 60-year-old current smoker with daily alcohol use. The FRAX tool also predicts 10-year fracture risks for black, Asian, and Hispanic women in the United States. In general, estimated fracture risks in nonwhite women are lower than those for white women of the same age.

Although the USPSTF recommends using a 9.3% 10-year fracture risk threshold to screen women aged 50 to 64 years, clinicians also should consider each patient's values and preferences and use clinical judgment when discussing screening with women in this age group. Menopausal status is one factor that may affect a decision about screening in this age group.

Considerations for Practice Regarding the I Statement

When deciding whether to screen men for osteoporosis, clinicians should consider the following factors.

Potential Preventable Burden

Bone measurement tests may potentially detect osteoporosis in a large number of men and prevent a substantial part of the burden of fractures and fracture-related illness in this population. The aging of the U.S. population is likely to increase this potentially preventable burden in future years.

Potential Harms

Potential harms of screening men are likely to be small and consist primarily of opportunity costs.

Current Practice

Routine screening of men currently is not a widespread practice.

Costs

Many additional DXA scanners may be required to screen sizeable populations of men for osteoporosis; DXA machines range in cost from \$25,000 to \$85,000.

Assuming that the relative benefits and harms of therapy in men are similar to those in women, the men most likely to benefit from screening would have 10-year risks for osteoporotic fracture equal to or greater than those of 65-year-old white women who have no additional risk factors. However, current evidence is insufficient to assess the balance of benefits and harms of screening for osteoporosis in men.

Screening Tests

The most commonly used bone measurement tests used to screen for osteoporosis are DXA of the hip and lumbar spine and quantitative ultrasonography of the calcaneus. Quantitative ultrasonography is less expensive and more portable than DXA and does not expose patients to ionizing radiation. Quantitative ultrasonography of the calcaneus predicts fractures of the femoral neck, hip, and spine as effectively as DXA. However, current diagnostic and treatment criteria for osteoporosis rely on DXA measurements only, and criteria based on quantitative ultrasonography or a combination of quantitative ultrasonography and DXA have not been defined.

Screening Intervals

The potential value of rescreening women whose initial screening test did not detect osteoporosis is to improve fracture risk prediction. A lack of evidence exists about optimal intervals for repeated screening and whether repeated screening is necessary in a woman with normal BMD. Because of limitations in the precision of testing, a minimum of 2 years may be needed to reliably measure a change in BMD; however, longer intervals may be necessary to improve fracture risk prediction. A prospective study of 4,124 women aged 65 years or older found that neither repeated BMD measurement nor the change in BMD after 8 years was more predictive of subsequent fracture risk than the original measurement.

Treatment

In addition to adequate calcium and vitamin D intake and weight-bearing exercise, multiple drug therapies are approved by the U.S. Food and Drug Administration to reduce fractures, including bisphosphonates, parathyroid hormone, raloxifene, and estrogen. The choice of therapy should be an individual one based on the patient's clinical situation and the tradeoff between benefits and harms. Clinicians should provide patient education on how to use drug therapies to minimize adverse effects. For example, esophageal irritation from bisphosphonate therapy can be reduced by taking the medication with a full glass of water and by not lying down for at least 30 minutes afterward.

Other Approaches to Prevention

The USPSTF has updated its evidence review on falls prevention in older adults and plans to issue an updated recommendation; in future months the USPSTF will also issue a separate statement on the preventive effects of vitamin D and calcium supplements on osteoporotic fractures. When complete, these documents will be made available at www.uspreventiveservicestaskforce.org .

Useful Resources

The 10-year risk for osteoporotic fractures can be calculated for individuals by using the FRAX tool and could help to guide screening decisions for women younger than 65 years.

Summary guides for clinicians and patients on fracture prevention treatments for postmenopausal women who have osteoporosis are available from the Agency for Healthcare Research and Quality at <http://effectivehealthcare.ahrq.gov> . The recommendations in these guides may differ from those of the USPSTF because they were based on a systematic review that pooled data from trials that included women who had previous clinical fractures.

Definitions:

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is moderate or high certainty that the net benefit is small.	Offer or provide this service only if other considerations support offering or providing the service in an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or	Discourage the use of this service.

Grade	that the harms outweigh the benefits.	Suggestions for Practice
I	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read "Clinical Considerations" section of USPSTF Recommendation Statement (see "Major Recommendations" field). If this service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The U.S. Preventive Services Task Force defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	<p>The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as:</p> <ul style="list-style-type: none"> • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence <p>As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.</p>
Low	<p>The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of:</p> <ul style="list-style-type: none"> • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes <p>More information may allow an estimation of effects on health outcomes.</p>

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Osteoporosis

Guideline Category

Prevention

Risk Assessment

Screening

Clinical Specialty

Family Practice

Geriatrics

Internal Medicine

Obstetrics and Gynecology

Preventive Medicine

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Nurses

Physician Assistants

Physicians

Students

Guideline Objective(s)

- To summarize the current U.S. Preventive Services Task Force (USPSTF) recommendations on screening for osteoporosis and the supporting scientific evidence
- To update the 2002 recommendations on screening for osteoporosis

Target Population

Older adults in the general U.S. population who do not have a history of an osteoporotic fracture, osteoporosis secondary to another condition, or other specific clinical indications for bone measurement testing

Note: The U.S. Preventive Services Task Force (USPSTF) did not define a specific upper age limit for screening in women because the risk for fractures continues to increase with age and treatment harms remain no greater than small. Clinicians should take into account the patient's remaining lifespan when deciding whether to screen patients with significant illness.

Interventions and Practices Considered

1. Risk assessment using a tool such as the Fracture Risk Assessment Tool (FRAX)
2. Bone mineral density (BMD) measurements using:
 - Dual-energy x-ray absorptiometry (DXA) of the hip and lumbar spine
 - Quantitative ultrasonography (QUS) of the calcaneus

Major Outcomes Considered

Key Question 1: Does screening for osteoporosis and low bone density reduce osteoporosis-related fractures and/or fracture-related morbidity and mortality in the target populations? These include postmenopausal women (aged <60 years, 60–64 years at increased risk for osteoporotic fractures, 60–64 years not at increased risk for osteoporotic fractures, and ≥65 years) and men aged >50 years.

Key Question 2: What valid and reliable risk-assessment instruments stratify women and men into risk categories for osteoporosis or fractures?

Key Question 3A: How well does dual-energy x-ray absorptiometry (DXA) predict fractures in men?

Key Question 3B: How well do peripheral bone measurement tests predict fractures?

Key Question 3C: What is the evidence to determine screening intervals for osteoporosis and low bone density?

Key Question 4: What are the harms associated with osteoporosis screening?

Key Question 5: Do medications for osteoporosis and low bone density reduce osteoporosis-related fracture rates and/or fracture-related morbidity and mortality in the target populations?

Key Question 6: What are the harms associated with medications for osteoporosis and low bone density?

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse: A systematic evidence review was prepared by the Oregon Evidence-Based Practice Center (EPC) for the Agency for Healthcare Research and Quality (AHRQ) to be used by the U.S. Preventive Services Task Force (USPSTF) (see "Availability of Companion Documents" field).

Data Sources and Searches

The Cochrane Central Register of Controlled Trials and Cochrane Database of Systematic Reviews (through the fourth quarter of 2009) and MEDLINE (January 2001 to December 2009) were searched for relevant studies and systematic reviews. A technical report describes search strategies and additional details. Reviewers also conducted secondary referencing by manually reviewing reference lists of key papers and searching citations by using Web of Science. For additional details of the search strategy, refer to Appendix B1 of the Evidence Synthesis (see "Availability of Companion Documents" field).

Study Selection

Studies were selected on the basis of inclusion and exclusion criteria developed for each key question. Fracture or fracture-related morbidity and mortality outcomes were included to determine the effectiveness of osteoporosis screening, and studies of any design were included to determine harms from screening. For a complete list of the inclusion and exclusion criteria, refer to Appendix B2 of the Evidence Synthesis (see "Availability of Companion Documents" field).

To determine the accuracy and clinical applicability of risk-assessment instruments, studies of externally validated instruments that reported performance characteristics were included. Instruments were included if they were derived from an initial population and then tested in a separate population; derived from computer modeling, consensus, or another study and then tested in a novel population; or derived from any source and tested against T-scores or actual fracture rates in a population. Internally validated measures (imputation methods or cross-validation) were not included. To determine the performance of bone measurement tests in predicting fractures, studies were limited to existing systematic reviews and

technology assessments of procedures currently used in U.S. practice and large population-based studies relevant to primary care settings. Any studies providing data about screening intervals were included.

To evaluate the efficacy and harms of medications to reduce fractures in a screening-detected population, randomized controlled trials (RCTs) and meta-analyses of RCTs that reported fracture and fracture-related outcomes and adverse effects for medications used in the United States were included. Outcomes included specific types of fractures; fracture-related morbidity, including loss of function, pain, quality of life, and other reported health outcomes; and fracture-related mortality. Nondrug therapies were excluded because they are addressed in other reviews for the USPSTF (for example, calcium, vitamin D, exercise, and fall prevention) and combination therapies. Reviewers focused on trials that enrolled patients without known previous osteoporosis-related fragility fractures, such as vertebral compression or hip fractures, and without known secondary causes of osteoporosis because this population is most relevant to screening. They included trials that met 1 of the following 3 criteria. First, the trial excluded persons with previous vertebral or other presumably osteoporotic fractures. Second, the trial permitted persons with previous osteoporotic fractures, but the overall proportion of participants with fractures was less than 20%, or the trial reported results separately for participants with and without previous fractures. Reviewers considered trials meeting this criterion to be applicable to primary prevention based on epidemiologic data. Third, the trial did not report the proportion of participants with previous osteoporotic fractures, but inclusion criteria did not select persons on the basis of presence of a previous fracture, and mean bone mineral density (BMD) T-scores were -3.0 or more. This threshold was selected because placebo-controlled trials that enrolled more than 20% of women with previous fractures reported mean baseline BMD T-scores less than -3.0 .

Reviewers determined harms from good- and fair-quality systematic reviews that pooled primary and secondary prevention trials after verifying data abstraction and statistical analyses and large controlled observational studies. For osteonecrosis of the jaw, they included systematic reviews summarizing evidence from case reports and series.

Number of Source Documents

A total of 3,858 potentially relevant articles were identified in the literature search, and 537 full-text articles were reviewed with inclusion and exclusion criteria for relevance. The number of articles by key question included in the review is detailed in a flow diagram in Appendix 3B of the Evidence Synthesis (see "Availability of Companion Documents" field).

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

The overall strength of the body of evidence for each key question (good, fair, poor) was assessed using methods developed by the U.S. Preventive Services Task Force (USPSTF) on the basis of the number, quality, and size of studies; consistency of results between studies; and directness of evidence (described in Appendices B5, B6, and B7 of the Evidence Synthesis; see "Availability of Companion Documents" field).

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): A systematic evidence review was prepared by the Oregon Evidence-based Practice Center (EPC) for the Agency for Healthcare Research and Quality (AHRQ) for use by the U.S. Preventive Services Task Force (USPSTF) (see the "Availability of Companion Documents" field).

Data Abstraction and Quality Assessment

Details about the patient population, study design, analysis, follow-up, and results were abstracted. Using predefined criteria developed by the USPSTF, 2 investigators rated the quality of studies (good, fair, or poor) and resolved discrepancies by consensus. They assessed the overall strength of the body of evidence for each key question (good, fair, or poor) using methods developed by the USPSTF on the basis of the number, quality, and size of studies; consistency of results between studies; and directness of evidence.

Data Synthesis and Analysis

Reviewers pooled results of primary prevention trials of bisphosphonates for various fracture outcomes (vertebral, nonvertebral, hip, wrist, and ankle) by using the random-effects Mantel–Haenszel method in Review Manager (Rev-Man), Version 5.0 (The Nordic Cochrane Centre, The Cochrane Collaboration, Copenhagen, Denmark). The random-effects model was chosen because of differences in study participant characteristics, such as baseline bone mineral density (BMD), previous fractures, and risk factors for osteoporosis. Results were also stratified by type of bisphosphonate if sufficient data for pooling were available. For trials that evaluated several doses, reviewers focused on outcomes for doses similar to those currently recommended in the package inserts approved by the U.S. Food and Drug Administration (FDA).

Several trials included in the meta-analyses reported few, rare, or 0 fracture events. The primary analyses excluded trials with 0 events in both groups, resulting in loss of data, and applied a constant continuity correction of 0.5 for trials with 0 events in 1 group, potentially biasing inferences. In addition, the random-effects Mantel–Haenszel method that was used may be unsuitable when events are rare. Reviewers therefore conducted sensitivity analyses to determine the effects of alternate pooling methods on estimates by using the Peto odds ratio (OR), fixed-effects Mantel–Haenszel method with an alternative continuity correction, and the pooled arcsine difference. Details about the methods and results of these analyses, as well as other sensitivity analyses, are provided in the Evidence Synthesis (see the "Availability of Companion Documents" field).

Methods Used to Formulate the Recommendations

Balance Sheets

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The U.S. Preventive Services Task Force (USPSTF) systematically reviews the evidence concerning both the benefits and harms of widespread implementation of a preventive service. It then assesses the certainty of the evidence and the magnitude of the benefits and harms. On the basis of this assessment, the USPSTF assigns a letter grade to each preventive service signifying its recommendation about provision of the service (see Table below). An important, but often challenging, step is determining the balance between benefits and harms to estimate "net benefit" (that is, benefits minus harms).

Table 1. U.S. Preventive Services Task Force Recommendation Grid*

Certainty of Net Benefit	Magnitude of Net Benefit			
	Substantial	Moderate	Small	Zero/Negative
High	A	B	C	D
Moderate	B	B	C	D
Low	Insufficient			

*A, B, C, D, and I (*Insufficient*) represent the letter grades of recommendation or statement of insufficient evidence assigned by the USPSTF after assessing certainty and magnitude of net benefit of the service (see the "Rating Scheme for the Strength of the Recommendations" field).

The overarching question that the USPSTF seeks to answer for every preventive service is whether evidence suggests that provision of the service would improve health outcomes if implemented in a general primary care population. For screening topics, this standard could be met by a large randomized, controlled trial (RCT) in a representative asymptomatic population with follow-up of all members of both the group "invited for screening" and the group "not invited for screening."

Direct RCT evidence about screening is often unavailable, so the USPSTF considers indirect evidence. To guide its selection of indirect evidence,

the USPSTF constructs a "chain of evidence" within an analytic framework. For each key question, the body of pertinent literature is critically appraised, focusing on the following 6 questions:

1. Do the studies have the appropriate research design to answer the key question(s)?
2. To what extent are the existing studies of high quality? (i.e., what is the internal validity?)
3. To what extent are the results of the studies generalizable to the general U.S. primary care population and situation? (i.e., what is the external validity?)
4. How many studies have been conducted that address the key question(s)? How large are the studies? (i.e., what is the precision of the evidence?)
5. How consistent are the results of the studies?
6. Are there additional factors that assist the USPSTF in drawing conclusions (e.g., presence or absence of dose-response effects, fit within a biologic model)?

The next step in the process is to use the evidence from the key questions to assess whether there would be net benefit if the service were implemented. In 2001, the USPSTF published an article that documented its systematic processes of evidence evaluation and recommendation development. At that time, the USPSTF's overall assessment of evidence was described as good, fair, or poor. The USPSTF realized that this rating seemed to apply only to how well studies were conducted and did not fully capture all of the issues that go into an overall assessment of the evidence about net benefit. To avoid confusion, the USPSTF has changed its terminology. Whereas individual study quality will continue to be characterized as good, fair, or poor, the term *certainty* will now be used to describe the USPSTF's assessment of the overall body of evidence about net benefit of a preventive service and the likelihood that the assessment is correct. Certainty will be determined by considering all 6 questions listed above; the judgment about certainty will be described as high, moderate, or low.

In making its assessment of certainty about net benefit, the evaluation of the evidence from each key question plays a primary role. It is important to note that the USPSTF makes recommendations for real-world medical practice in the United States and must determine to what extent the evidence for each key question—even evidence from screening RCTs or treatment RCTs—can be applied to the general primary care population. Frequently, studies are conducted in highly selected populations under special conditions. The USPSTF must consider differences between the general primary care population and the populations studied in RCTs and make judgments about the likelihood of observing the same effect in actual practice.

It is also important to note that one of the key questions in the analytic framework refers to the potential harms of the preventive service. The USPSTF considers the evidence about the benefits and harms of preventive services separately and equally. Data about harms are often obtained from observational studies because harms observed in RCTs may not be representative of those found in usual practice and because some harms are not completely measured and reported in RCTs.

Putting the body of evidence for all key questions together as a chain, the USPSTF assesses the certainty of net benefit of a preventive service by asking the 6 major questions listed above. The USPSTF would rate a body of convincing evidence about the benefits of a service that, for example, derives from several RCTs of screening in which the estimate of benefits can be generalized to the general primary care population as "high" certainty (see the "Rating Scheme for the Strength of Recommendations" field). The USPSTF would rate a body of evidence that was not clearly applicable to general practice or has other defects in quality, research design, or consistency of studies as "moderate" certainty. Certainty is "low" when, for example, there are gaps in the evidence linking parts of the analytic framework, when evidence to determine the harms of treatment is unavailable, or when evidence about the benefits of treatment is insufficient. Table 4 in the methodology document listed below (see "Availability of Companion Documents" field) summarizes the current terminology used by the USPSTF to describe the critical assessment of evidence at all 3 levels: individual studies, key questions, and overall certainty of net benefit of the preventive service.

Sawaya GF et al. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. *Ann Intern Med.* 2007;147:871-875.[5 references].

I Statements

For I statements, the USPSTF has a new plan to commission its Evidence-based Practice Centers to collect information in 4 domains pertinent to clinical decisions about prevention and to report this information routinely. This plan is described in the paper: Petitti DB et al. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. *Ann Intern Med.* 2009;150:199-205 (see "Availability of Companion Documents" field).

The first domain is potential preventable burden of suffering from the condition. When evidence is insufficient, provision of an intervention designed to prevent a serious condition (such as dementia) might be viewed more favorably than provision of a service designed to prevent a condition that does not cause as much suffering (such as rash). The USPSTF recognized that "burden of suffering" is subjective and involves judgment. In clinical settings, it should be informed by patient values and concerns.

The second domain is potential harm of the intervention. When evidence is insufficient, an intervention with a large potential for harm (such as major surgery) might be viewed less favorably than an intervention with a small potential for harm (such as advice to watch less television). The USPSTF again acknowledges the subjective nature and the difficulty of assessing potential harms: for example, how bad is a "mild" stroke?

The third domain is cost—not just monetary cost, but opportunity cost, in particular the amount of time a provider spends to provide the service, the amount of time the patient spends to partake of it, and the benefits that might derive from alternative uses of the time or money for patients, clinicians, or systems. Consideration of clinician time is especially important for preventive services with only insufficient evidence because providing them could "crowd out" provision of preventive services with proven value, services for conditions that require immediate action, or services more desired by the patient. For example, a decision to routinely inspect the skin could take up the time available to discuss smoking cessation, or to address an acute problem or a minor injury that the patient considers important.

The fourth domain is current practice. This domain was chosen because it is important to clinicians for at least 2 reasons. Clinicians justifiably fear that not doing something that is done on a widespread basis in the community may lead to litigation. More important, addressing patient expectations is a crucial part of the clinician–patient relationship in terms of building trust and developing a collaborative therapeutic relationship. The consequences of not providing a service that is neither widely available nor widely used are less serious than not providing a service accepted by the medical profession and thus expected by patients. Furthermore, ingrained care practices are difficult to change, and efforts should preferentially be directed to changing those practices for which the evidence to support change is compelling.

Although the reviewers did not explicitly recognize it when these domains were chosen, the domains all involve consideration of the potential consequences—for patients, clinicians, and systems—of providing or not providing a service. Others writing about medical decision making in the face of uncertainty have suggested that the consequences of action or inaction should play a prominent role in decisions.

Rating Scheme for the Strength of the Recommendations

What the U.S. Preventive Services Task Force (USPSTF) Grades Mean and Suggestions for Practice

Grade	Grade Definitions	Suggestions for Practice
A	The USPSTF recommends the service. There is high certainty that the net benefit is substantial.	Offer or provide this service.
B	The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.	Offer or provide this service.
C	The USPSTF recommends against routinely providing the service. There may be considerations that support providing the service in an individual patient. There is moderate or high certainty that the net benefit is small.	Offer or provide this service only if other considerations support offering or providing the service in an individual patient.
D	The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.	Discourage the use of this service.
I Statement	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.	Read "Clinical Considerations" section of USPSTF Recommendation Statement (see "Major Recommendations" field). If this service is offered, patients should understand the uncertainty about the balance of benefits and harms.

USPSTF Levels of Certainty Regarding Net Benefit

Definition: The U.S. Preventive Services Task Force defines certainty as "likelihood that the USPSTF assessment of the net benefit of a preventive service is correct." The net benefit is defined as benefit minus harm of the preventive service as implemented in a general, primary care population. The USPSTF assigns a certainty level based on the nature of the overall evidence available to assess the net benefit of a preventive service.

Level of Certainty	Description
High	The available evidence usually includes consistent results from well-designed, well-conducted studies in representative primary care populations. These studies assess the effects of the preventive service on health outcomes. This conclusion is therefore unlikely to be strongly affected by the results of future studies.
Moderate	<p>The available evidence is sufficient to determine the effects of the preventive service on health outcomes, but confidence in the estimate is constrained by factors such as:</p> <ul style="list-style-type: none"> • The number, size, or quality of individual studies • Inconsistency of findings across individual studies • Limited generalizability of findings to routine primary care practice • Lack of coherence in the chain of evidence <p>As more information becomes available, the magnitude or direction of the observed effect could change, and this change may be large enough to alter the conclusion.</p>
Low	<p>The available evidence is insufficient to assess effects on health outcomes. Evidence is insufficient because of:</p> <ul style="list-style-type: none"> • The limited number or size of studies • Important flaws in study design or methods • Inconsistency of findings across individual studies • Gaps in the chain of evidence • Findings not generalizable to routine primary care practice • A lack of information on important health outcomes <p>More information may allow an estimation of effects on health outcomes.</p>

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

Comparison with Guidelines from Other Groups

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Peer Review. Before the U.S. Preventive Services Task Force makes its final determinations about recommendations on a given preventive service, the Evidence-Based Practice Center and the Agency for Healthcare Research and Quality send a draft evidence review to 4 to 6 external experts and to federal agencies and professional and disease-based health organizations with interests in the topic. They ask the experts to examine the review critically for accuracy and completeness and to respond to a series of specific questions about the document. After assembling these external review comments and documenting the proposed response to key comments, the topic team presents this information to the Task Force in memo form. In this way, the Task Force can consider these external comments before it votes on its recommendations about the service. Draft recommendation statements are then circulated for comment among reviewers representing professional societies, voluntary organizations and Federal agencies, as well as posted on the Task Force Web site for public comment. These comments are discussed before the final recommendations are confirmed.

Recommendations of Others. Recommendations for osteoporosis screening from the following groups were discussed: National Osteoporosis Foundation, World Health Organization, American Academy of Family Physicians, American College of Physicians, and the American Congress of Obstetricians and Gynecologists.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is not specifically stated for each recommendation.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Benefits of Detection and Early Intervention

- No controlled studies have evaluated the effect of screening for osteoporosis on fracture rates or fracture-related morbidity or mortality.
- In postmenopausal women who have no previous osteoporotic fractures, the U.S. Preventive Services Task Force (USPSTF) found convincing evidence that drug therapies reduce the risk for fractures. In women aged 65 years or older and in younger women whose fracture risk is equal to or greater than that of a 65-year-old white woman who has no additional risk factors, the USPSTF judged that the benefit of treating screening-detected osteoporosis is at least moderate.
- Because of the lack of relevant studies, the USPSTF found inadequate evidence that drug therapies reduce the risk for fractures in men who have no previous osteoporotic fractures. The USPSTF identified the absence of randomized trials of primary fracture prevention in men who have osteoporosis as a critical gap in the evidence.

Potential Harms

Harms of Detection and Early Intervention

The U.S. Preventive Services Task Force (USPSTF) found no new studies that described harms of screening for osteoporosis in men or women. Screening with dual x-ray absorptiometry (DXA) is associated with opportunity costs (time and effort required by patients and the health care system). Harms of drug therapies for osteoporosis depend on the specific medication used. The USPSTF found adequate evidence that the harms of bisphosphonates, the most commonly prescribed therapies, are no greater than small. Convincing evidence indicates that the harms of estrogen and selective estrogen receptor modulators are small to moderate.

Qualifying Statements

Qualifying Statements

- Recommendations made by the U.S. Preventive Services Task Force (USPSTF) are independent of the U.S. government. They should not be construed as an official position of the Agency for Healthcare Research and Quality or the U.S. Department of Health and Human Services.
- The USPSTF makes recommendations about preventive care services for patients without recognized signs or symptoms of the target condition.
- Recommendations are based on a systematic review of the evidence of the benefits and harms and an assessment of the net benefit of the service.
- The USPSTF recognizes that clinical or policy decisions involve more considerations than this body of evidence alone. Clinicians and policymakers should understand the evidence but individualize decision making to the specific patient or situation.

Implementation of the Guideline

Description of Implementation Strategy

The experiences of the first and second U.S. Preventive Services Task Force (USPSTF), as well as that of other evidence-based guideline efforts, have highlighted the importance of identifying effective ways to implement clinical recommendations. Practice guidelines are relatively weak tools for changing clinical practice when used in isolation. To effect change, guidelines must be coupled with strategies to improve their acceptance and feasibility. Such strategies include enlisting the support of local opinion leaders, using reminder systems for clinicians and patients, adopting standing orders, and audit and feedback of information to clinicians about their compliance with recommended practice.

In the case of preventive services guidelines, implementation needs to go beyond traditional dissemination and promotion efforts to recognize the added patient and clinician barriers that affect preventive care. These include clinicians' ambivalence about whether preventive medicine is part of their job, the psychological and practical challenges that patients face in changing behaviors, lack of access to health care or of insurance coverage for preventive services for some patients, competing pressures within the context of shorter office visits, and the lack of organized systems in most practices to ensure the delivery of recommended preventive care.

Dissemination strategies have changed dramatically in this age of electronic information. While recognizing the continuing value of journals and other print formats for dissemination, the Task Force will make all USPSTF products available through its [Web site](#) . The combination of electronic access and extensive material in the public domain should make it easier for a broad audience of users to access USPSTF materials and adapt them for their local needs. Online access to USPSTF products also opens up new possibilities for the appearance of the annual, pocket-size *Guide to Clinical Preventive Services*.

To be successful, approaches for implementing prevention have to be tailored to the local level and deal with the specific barriers at a given site, typically requiring the redesign of systems of care. Such a systems approach to prevention has had notable success in established staff-model health maintenance organizations, by addressing organization of care, emphasizing a philosophy of prevention, and altering the training and incentives for clinicians. Staff-model plans also benefit from integrated information systems that can track the use of needed services and generate automatic reminders aimed at patients and clinicians, some of the most consistently successful interventions. Information systems remain a major challenge for individual clinicians' offices, however, as well as for looser affiliations of practices in network-model managed care and independent practice associations, where data on patient visits, referrals, and test results are not always centralized.

Implementation Tools

Foreign Language Translations

Mobile Device Resources

Patient Resources

Quick Reference Guides/Physician Guides

Resources

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Staying Healthy

IOM Domain

Effectiveness

Identifying Information and Availability

Bibliographic Source(s)

U.S. Preventive Services Task Force. Screening for osteoporosis: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med.* 2011 Mar 1;154(5):356-64. [PubMed](#)

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

1996 (revised 2011 Mar 1)

Guideline Developer(s)

U.S. Preventive Services Task Force - Independent Expert Panel

Guideline Developer Comment

The U.S. Preventive Services Task Force (USPSTF) is a federally-appointed panel of independent experts. Conclusions of the USPSTF do not necessarily reflect policy of the U.S. Department of Health and Human Services (DHHS) or DHHS agencies.

Source(s) of Funding

United States Government

Guideline Committee

U.S. Preventive Services Task Force (USPSTF)

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**Members of the Task Force at the time this recommendation was finalized. For a list of current Task Force members, go to <http://www.uspreventiveservicestaskforce.org/Page/Name/our-members> .*

Financial Disclosures/Conflicts of Interest

The U.S. Preventive Services Task Force has an explicit policy concerning conflict of interest. All members disclose at each meeting if they have a significant financial, professional/business, or intellectual conflict for each topic being discussed. Task Force members with conflicts may be recused from discussing or voting on recommendations about the topic in question.

No potential financial conflicts of interest were disclosed.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Berg AO. Screening for osteoporosis in postmenopausal women: recommendations and rationale. *Am J Nurs* 2003 Jan;103(1):73-80; discussion 81. [33 references]

Screening for osteoporosis in postmenopausal women: recommendations and rationale. *Am Fam Physician* 2002 Oct 15;66(8):1430-2.

Guideline Availability

Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .

Availability of Companion Documents

The following are available:

Evidence Reviews:

- Nelson HD, Haney EM, Dana T, Bougatsos C, Chou R. Screening for osteoporosis: an update for the U.S. Preventive Services Task Force. *Ann Intern Med*. 2010 Jul;153(2):99-111.
- Nelson HD, Haney EM, Chou R, Dana T, Fu R, Bougatsos C. Screening for osteoporosis: systematic review to update the 2002 U.S. Preventive Services Task Force recommendation. Rockville (MD): Agency for Healthcare Research and Quality; 2010 Jul. (Evidence synthesis; no. 77).

Electronic copies: Available from the [U.S. Preventive Services Task Force \(USPSTF\) Web site](#) .

Background Information:

- Barton MB, Miller T, Wolff T, Petitti D, LeFevre M, Sawaya G, Yawn B, Guirguis-Blake J, Calonge N, Harris R. How to read the new recommendation statement: methods update from the U.S. Preventive Services Task Force. *Ann Intern Med* 2007;147:123-7.
- Guirguis-Blake J, Calonge N, Miller T, Siu A, Teutsch S, Whitlock E. Current processes of the U.S. Preventive Services Task Force: refining evidence-based recommendation development. *Ann Intern Med* 2007;147:117-22.
- Sawaya GF, Guirguis-Blake J, LeFevre M, Harris R, Petitti D, U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: estimating certainty and magnitude of net benefit. *Ann Intern Med* 2007;147:871-5.
- Leipzig RM, Whitlock EP, Wolff TA, Barton MB, Michael YL, Harris R, Petitti D, Wilt T, Siu A, U.S. Preventive Services Task Force. Reconsidering the approach to prevention recommendations for older adults. *Ann Intern Med* 2010;153:809-14.
- Petitti D, Teutsch SM, Barton MB, Sawaya GF, Ockene JK, DeWitt T, U.S. Preventive Services Task Force. Update on the methods of the U.S. Preventive Services Task Force: insufficient evidence. *Ann Intern Med* 2009;150:199-205.

Electronic copies: Available from the [USPSTF Web site](#) .

The following are also available:

- Screening for osteoporosis. Clinical summary of U.S. Preventive Services Task Force recommendation. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2011 Jan. 1 p. Electronic copies: Available from the [USPSTF Web site](#) .
- The guide to clinical preventive services, 2010-2011. Recommendations of the U.S. Preventive Services Task Force. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2010. 292 p. Electronic copies: Available in PDF from the [AHRQ Web site](#) .

The [Electronic Preventive Services Selector \(ePSS\)](#) , available as an application for several hand-held devices and a Web-based tool, is a quick hands-on tool designed to help primary care clinicians identify the screening, counseling, and preventive medication services that are appropriate for their patients. It is based on current recommendations of the USPSTF and can be searched by specific patient characteristics, such as age, sex, and selected behavioral risk factors.

Patient Resources

The following are available:

- Screening for osteoporosis: recommendations from the U.S. Preventive Services Task Force. Summaries for patients. Ann Intern Med. 2011 Mar;154(5):I40. Electronic copies: Available from the [Annals of Internal Medicine Web site](#) .
- Women: stay healthy at any age. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 10-IP002-A. 2010 Aug. 2 p. Electronic copies: Available in Portable Document Format (PDF) in [English](#) and [Spanish](#) from the U.S. Preventive Services Task Force Web site. See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#).
- Men: stay healthy at any age. Rockville (MD): Agency for Healthcare Research and Quality. AHRQ Pub. No. 10-IP004-A. 2010 Aug. 2 p. Electronic copies: Available in PDF in [English](#) and [Spanish](#) from the U.S. Preventive Services Task Force Web site. See the related QualityTool summary on the [Health Care Innovations Exchange Web site](#) .

Print copies: Available from the AHRQ Publications Clearinghouse. For more information, go to <http://www.ahrq.gov/research/publications/index.html> or call 1-800-358-9295 (U.S. only).

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NGC Status

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